T. W. PRATT.

Improvement in Truss-Bridges.

No. 114.039. Patented April 25, 1871.

Fig. 1.

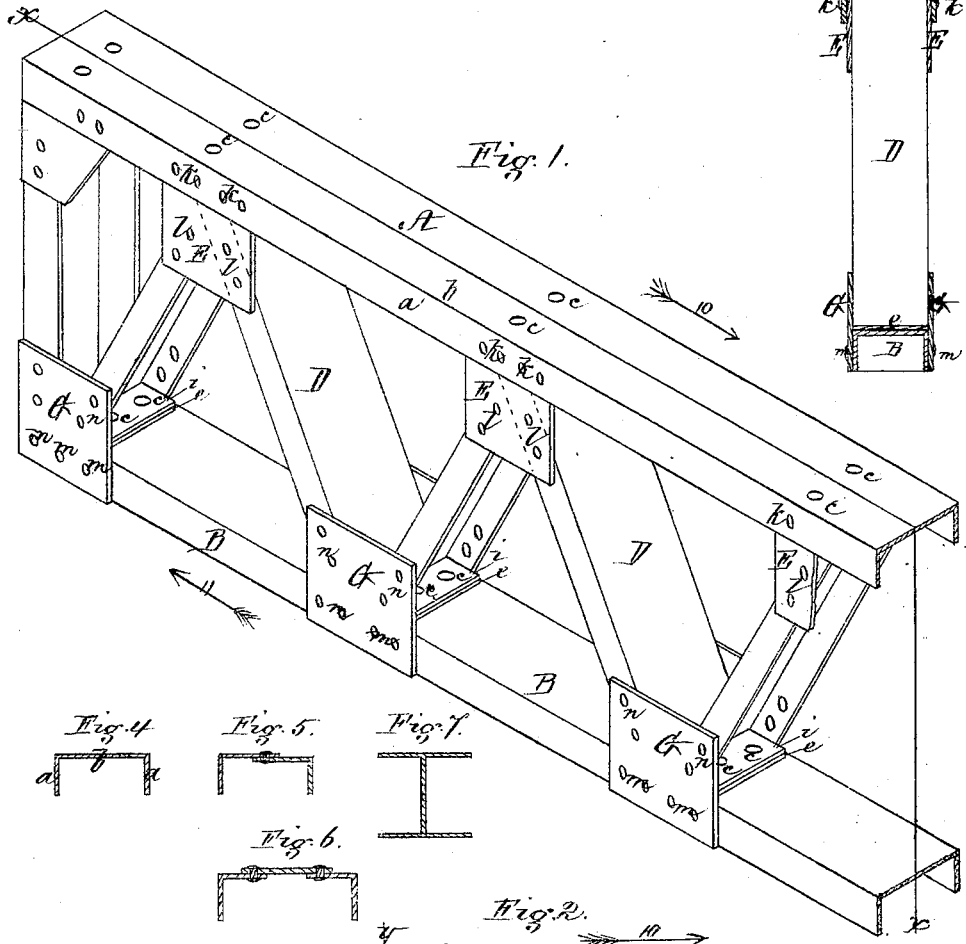


Fig. 3.

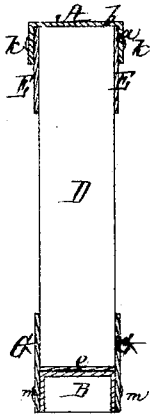


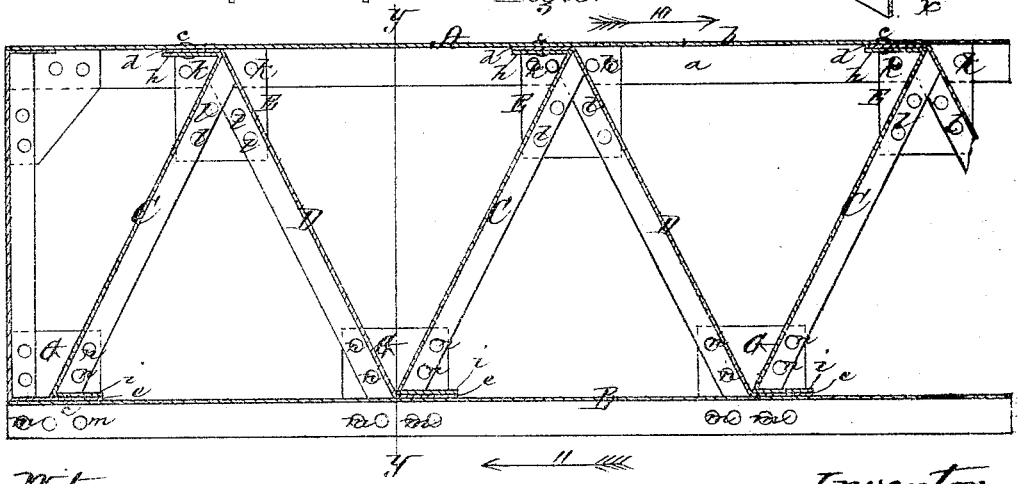
Fig. 4

Fig. 5.

Fig. 7.

Fig. 6.

Fig. 2.



Witnesses,
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T. WILLIS PRATT, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 114,039, dated April 25, 1871.

IMPROVEMENT IN TRUSS-BRIDGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, T. WILLIS PRATT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in the Construction of Iron Truss-Bridges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view of a section of a bridge constructed in accordance with my invention.

Figure 2 is a longitudinal section on the line *x x* of fig. 1.

Figure 3 is a vertical section on the line *y y* of fig. 2.

Figures 4, 5, 6, and 7, detail and modifications to be referred to.

My invention consists, first, in a peculiar connection of the strut and tension-braces with each other and the upper and lower "chords" of a bridge, in which the iron employed is of "channel" form; and

My invention consists secondly, in the application of one or more plates to each joint or point of connection of the strut and tension-braces with the upper and lower chords, for the purpose of adding strength at the points where the said braces are connected with the chords.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawing—

A represents the upper chord of a bridge, the chord being formed of iron, either cast or wrought, of channel form, well known to be that shown in fig. 4, in which the iron is so shaped that a flange, *a*, is produced below and at right angles to each side of the horizontal portion *b*, the flanges *a* being parallel, or nearly so, to each other.

This channel iron may be made in one piece, fig. 4, or be composed of two pieces of "angle"-iron riveted directly together, (fig. 5;) or of two pieces of angle-iron connected by a plate, fig. 6.

B represents the lower chord, of a form similar to that A.

The upper and lower lower chords A B are connected and fastened, by rivets *c* or otherwise, to strut-braces C and tension-braces D, likewise made of iron, of channel form—the strut-braces C being those which incline from the upper chord downward and away from the center of the bridge, and the tension-braces D being those which incline from the upper chord downward and toward the center of the bridge. The strut-braces may, however, be formed of I-shaped iron, fig. 7.

The upper and lower ends *d e* of the tension-braces are so bent in opposite directions as to fit snugly under and upon, and lie parallel to, the upper and lower chords A B, the upper and lower ends *h i* of the strut-braces C being also bent in opposite directions, as shown in section, fig. 2.

The upper ends or portions *h* of the strut-braces C are made to fit snugly under the upper ends or portions *d* of the tension-braces D, while the lower ends or portions *i* of the strut-braces C fit snugly upon the lower ends *e* of the tension-braces D, through which they are riveted to the upper and lower chords A B.

E E are flat metal plates, placed one at each side of the joints or points of connection of the tops of the braces C D with the upper chord B.

Each plate E is placed inside the flange *a* so as to shed water, and is riveted thereto at *k*, the plate being also riveted, at *l*, to the flanges *a* of both the strut and tension-braces.

G G are plates similar to those (E) riveted, at *m*, to the outside of the flanges *a* of the lower chord B, the plates G being also riveted, at *n*, to the flanges *a* of both the strut and tension-braces, by which construction the bond between the braces and chords is still further increased and strengthened; the joints which otherwise would be somewhat flexible being thereby rendered rigid, as required where the bridge is to support a weight in motion.

The beams supporting the floor of the bridge may be laid either upon the tops of the upper chords B, or upon the tops of the plates G, the space between these plates in either case being covered or filled up to prevent exposure to the weather.

It will be seen, from the foregoing, that a tensile strain is exerted on the braces D, which, at their upper ends, *d*, is converted into a horizontal thrust in the direction of or toward the center, as indicated by the arrow 10, while, at their lower ends, *e*, the horizontal strain is exerted in a direction from the center toward the ends of the bridge, as indicated by the arrow 11.

The upper and lower chords, as well as the braces, may be curved instead of straight, if desired; but I find it more economical and convenient to make them straight, as shown.

I-shaped or double-channel iron, fig. 7, may be used in the construction of triangular truss-bridges, instead of iron of single-channel form, fig. 4, if desired, without departing from the spirit of my invention.

Claims.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The peculiar method herein shown of connecting the strut and tension-braces C D with the upper and lower chords A B in the construction of triangular truss-bridges, substantially in the manner and for the purpose described.

2. The combination of the plates E G, formed as described and shown, strut and tension-braces C D, and "chords" A B, the whole constructed and operating as and for the purpose set forth.

Witness my hand this 8th day of February, A. D. 1871.

T. WILLIS PRATT.

Witnesses:
N. W. STEARNS,
W. J. CAMBRIDGE.